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EXAMINER	
WARE, CICELY Q	
ART UNIT	**PAPER NUMBER**
2611	

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,368	KENINGTON, PETER	
	Examiner	Art Unit	
	Cicely Ware	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *33-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *33-37,43-46,51-59,62 and 64* is/are rejected.

7)☒ Claim(s) *38-42,47-50,60,61 and 63* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see **REMARKS/ARGUMENTS**, filed 1/17/2006 with respect to the rejection(s) of claim(s) 33 under 35, USC 102 (b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shalom (US Patent 6,298,097) and Dent (US Patent 5,351,016).

Claim Objections

2. Claim 44 is objected to because of the following informalities:

a. Claim 44, lines 3, applicant ends with a ",". Examiner suggests applicant use a "." to signify the end of the claim for clarification purposes.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 33, 34, 44, 57, 58, 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Shalom (US Patent 6,298,097).

(1) With regard to claim 33, Shalom discloses in (Fig. 1) signal processing apparatus comprising a signal amplifier (34) and a frequency converter (22) which operate in succession on an input signal and a linearizer (24, Fig. 5 (58)) which is provided between the amplifier and the frequency converter to introduce a correction signal that is adapted to make the overall input and output characteristic of the apparatus more linear by linearizing both the amplifier and frequency converter means (abstract, col. 1, lines 29-39).

(2) With regard to claim 34, claim 34 inherits all the limitations of claim 33. Shalom further discloses wherein a feedback signal derived from the output of the apparatus is used by the linearizer to adapt the correction signal (col. 1, lines 29-39).

(3) With regard to claim 44, claim 44 inherits all the limitations of claim 33. Shalom further discloses in (Fig. 1) wherein the linearizer (24, Fig. 5 (58)) comprises a distortion generator for producing the correction signal from the output signal of whichever of the amplifier (34) and the frequency converter (22) precedes it (col. 1, lines 29-39).

(4) With regard to claim 57, see rejection of claim 33.

(5) With regard to claim 58, claim 58 inherits all the limitations of claims 57. See rejection of claim 34.

(6) With regard to claim 62, claim 62 inherits all the limitations of claim 57. See rejection of claim 44.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 35-36, 51, 52, 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalom (US Patent 6,298,097) as applied to claim 33, in view of Dent (US Patent 5,351,016).

(1) With regard to claim 35, claim 35 inherits all the limitations of claim 35. However Shalom does not disclose a pilot signal generator for introducing a pilot signal into the input signal prior to frequency conversion and amplification, wherein the feedback signal contains distortion components from the pilot signal produced by at least one of the frequency converter and the amplifier.

However Dent discloses in (Fig. 3) a pilot signal generator (110) for introducing a pilot signal into the input signal prior to frequency conversion (115) and amplification (116, 117), wherein the feedback signal contains distortion components from the pilot signal produced by at least one of the frequency converter (115) and the amplifier (116, 117) (col. 19, lines 32-68 – col. 20, lines 1-45).

Therefore it would have been obvious to one of ordinary skill in the art to modify Shalom in view of Dent to incorporate a pilot signal generator for introducing a pilot

signal into the input signal prior to frequency conversion and amplification, wherein the feedback signal contains distortion components from the pilot signal produced by at least one of the frequency converter and the amplifier in order to continuously and interactively adjust and compensate for mutable modulation inaccuracies and errors (Dent, col. 5, lines 55-62).

(2) With regard to claim 36, claim 36 inherits all the limitations of claim 35. Dent further discloses wherein the pilot signal is one of a CW carrier signal, a full carrier AM signal, a suppressed carrier AM signal, a single sideband signal, a quadrature amplitude modulated signal, a filter quadrature phase shift keyed signal, a direct sequence spread spectrum signal, and a frequency hopped carrier signal modulated with any of the foregoing kinds of signal (col. 19, lines 32-68 – col. 20, lines 1-45).

(3) With regard to claim 51, claim 51 inherits all the limitations of claim 33. Dent further discloses in (Fig. 3) wherein the frequency converter (115) comprises a mixer for mixing a mixing signal into a received signal destined to be frequency converted (col. 13, lines 1-7).

(4) With regard to claim 52, claim 52 inherits all the limitations of claim 33. Dent further discloses wherein the frequency converter is an upconverter for converting an intermediate frequency band signal into a radio frequency band signal (col. 13, lines 1-7).

(5) With regard to claim 59, claim 59 inherits all the limitations of claim 58. See rejection of claim 35.

7. Claims 37, 45, 56 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalom (US Patent 6,298,097) in view of Dent (US Patent 5,351,016), as applied to claims 33, 35, 44 and 57, in view of McNicol (US Patent 5,770,971) (cited by applicant).

(1) With regard to claim 37, claim 37 inherits all the limitations of claim 35. However Shalom in combination with Dent do not disclose wherein the pilot is one of a two-tone pilot signal and a multi-tone pilot signal.

However McNicol discloses wherein the pilot is one of a two-tone pilot signal and a multi-tone pilot signal (col. 3, lines 34-38, col. 5, lines 53-57).

Therefore it would have been obvious to one of ordinary skill in the art to modify Shalom in combination with Dent in view of McNicol to incorporate wherein the pilot is one of a two-tone pilot signal and a multi-tone pilot signal in order to reduce intermodulation distortion among the multiple channels (McNicol, col. 3, lines 40-41).

(2) With regard to claim 45, claim 45 inherits all the limitations of claim 44. McNicol further discloses in (Fig. 1) wherein the distortion generator (42) comprises a non-linearity generator (12, 16) to adaptively control the gain and phase of the compensation signal component in order to reduce the total distortion produced by the system (col. 4, lines 2-7, col. 5, lines 63-66).

(3) With regard to claim 56, claim 56 inherits all the limitations of claim 33. McNicol further discloses wherein the input signal is a CDMA signal to provide sufficient envelope fluctuation (col. 8, lines 58-63).

(4) With regard to claim 64, claim 64 inherits all the limitations of claims 57 and 56.

8. Claim 43 are rejected under 35 U.S.C. 103(a) as being obvious over Shalom (US Patent 6,298,097) as applied to claims 33, in view of Kenington et al. (US Patent 5,334,946).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

(1) With regard to claim 43, claim 43 inherits all the limitations of claim 33. However Shalom does not disclose wherein a digital signal processor is used to control the correction signal using feedback from the output of the signal processing apparatus.

However Kenington et al. discloses in (Fig. 2 (17, 40, 18')) wherein a digital signal processor is used to control the correction signal using feedback from the output of the signal processing apparatus (abstract, col. 8, lines 31-35, col. 10, lines 31-32).

Therefore it would have been obvious to one of ordinary skill in the art to modify Shalom in view of Kenington et al. to incorporate wherein a digital signal processor is used to control the correction signal using feedback from the output of the signal processing apparatus in order to remove distortion and problems that arise from temperature and aging (Kenington et al., col. 8, lines 53-55).

9. Claims 46, 53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalom (US Patent 6,298,097) in view of Dent (US Patent 5,351,016), as applied to claims 33, 35, 44 and 57, in view of McNicol (5,770,971) (cited by applicant), as applied to claims 45, 52, 54 and 62 and further in view of Faulkner et al. (US Patent 5,420,536).

(1) With regard to claim 46, claim 46 inherits all the limitations of claim 45. Shalom in combination with Dent in combination with McNicol disclose all the limitations of claim 45. However Shalom in combination with Dent in combination with McNicol do not disclose wherein the non-linearity generator uses at least one of anti-parallel diodes,

a FET channel, dual gate GaAsFETs operating close to pinch-off, Shottky diodes, mixers and multipliers in the non-linearity generating process.

However Faulkner et al. discloses wherein the non-linearity generator uses at least one of anti-parallel diodes, a FET channel, dual gate GaAsFETs operating close to pinch-off, Shottky diodes, mixers and multipliers in the non-linearity generating process (abstract, col. 2, line 68, col. 3, lines 1-2, col. 4, lines 3-18, col. 5, lines 64-68).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Shalom in combination with Dent in combination with McNicol in view of Faulkner et al. to incorporate wherein the non-linearity generator uses at least one of anti-parallel diodes, a FET channel, dual gate GaAsFETs operating close to pinch-off, Shottky diodes, mixers and multipliers in the non-linearity generating process for dynamic variation or modulation of an operating point of the RF amplifier, which is the dynamic bias (Faulkner et al., col. 4, lines 3-5).

(2) With regard to claim 53, claim 53 inherits all the limitations of claim 52. Faulkner et al. further discloses in (Fig. 3) wherein the frequency converter comprises in-phase (17) and quadrature signal (18) paths for handling in-phase and quadrature signals representing a signal at the intermediate frequency band, wherein there is a separate independently controlled, linearizer (19, 20, 21) operating on each of these signal paths to provide excellent reduction in intermodulation distortion and give power added efficiencies.

(3) With regard to claim 55, claim 55 inherits all the limitations of claims 54 and 53.

10. Claim 54 is rejected under 35 U.S.C. 103(a) as being obvious over Shalom (US Patent 6,298,097) as applied to claim 33, in view of Voyce et al. (US Patent 4,929,906).

With regard to claim 54, claim 54 inherits all the limitations of claim 33. However Shalom does not disclose wherein the frequency converter is a downconverter for converting a radio frequency band signal into an intermediate frequency band signal.

However Voyce et al. discloses in (Fig. 1) wherein the frequency converter is a downconverter (12) for converting a radio frequency band signal into an intermediate frequency band signal (col. 2, lines 43-45, col. 3, lines 16-18).

Therefore it would have been obvious to one of ordinary skill in the art to modify Shalom in view of Voyce et al. to incorporate wherein the frequency converter is a downconverter for converting a radio frequency band signal into an intermediate frequency band signal to permit a greater range of choice for implementing a filter so as to maximize the stability and efficiency and minimize the cost of the system (Voyce et al., col. 3, lines 47-54).

Allowable Subject Matter

11. Claims 38-42, 47-50, 60, 61 and 63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a

statement of reasons for the indication of allowable subject matter: The instant application discloses a signal processing apparatus. Prior art references show similar methods but fail to teach: "**the pilot is removed from the output of the apparatus by a filter or by the introduction of a pilot cancellation signal**", as in claim 38; **"the pilot cancellation signal is adjusted using feedback derived from the output of the apparatus"**, as in claim 39; **"the pilot cancellation signal comprises a frequency converted, phase shifted and amplitude adjusted version of the pilot signal"**, as in claim 40; **"a digital processor is used to control the pilot cancellation signal using feedback from the output of the signal processing apparatus"**, as in claim 41; **"a suppressor for canceling signals which are images of the pilot signal"**, as in claim 42; **"the non-linearity generator is arranged to generate the non-linearity by mixing its input signal with itself one or more times to produce the non-linearity"**, as in claim 47; **"the non-linearity generator is arranged to generate a third order non-linearity by mixing the input to the non-linearity generator with itself and then with its input"**, as in claim 48; **"components of the non-linearity are generated and controlled separately"**, as in claim 49; **"wherein in-phase and quadrature signals are produced from each separately generated non-linearity component and are controlled separately"**, as in claim 50; **"the step of removing the pilot signal from the output signal of the method by filtering or by introducing a pilot cancellation signal"**, as in claim 60; **"the pilot cancellation signal using feedback derived from the output signal of the signal processing method"**, as in claim 61; **"distortion**

generation comprises the step of generating and controlling non-linearity components independently", as in claim 63.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
March 23, 2006

KHAI TRAN
PRIMARY EXAMINER